REMARKS/ARGUMENTS

Claims 10-18 are pending in this application. By this Amendment, Applicant amends Claim 10.

Claims 10-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Lipskier (U.S. 5,910,286) in view of Kadota (U.S. 6,366,002). Applicant respectfully traverses the rejection of Claims 10-18.

Claim 10 has been amended to recite:

> A surface acoustic wave sensor for detecting the minute mass applied to a surface acoustic wave element on the basis of the change in frequency using an SH-type surface acoustic wave, the surface acoustic wave sensor comprising:
>
> a rotated Y-cut $LiTaO_3$ substrate having Euler angles of (0°, 0° to 18°, 0° $\pm$ 5°) or (0°, 58° to 180°, 0° $\pm$ 5°);
>
> **electrodes, principally containing Au, and arranged on the $LiTaO_3$ substrate to excite a surface acoustic wave**; and
>
> **a reaction membrane, bound to a target substance or a binding substance bound to the target substance, covering the electrodes arranged on the $LiTaO_3$ substrate**; wherein
>
> the electrodes have a normalized thickness of about 0.8% to about 9.5%, the normalized thickness being determined by normalizing the thickness of the electrodes by the wavelength of the surface acoustic wave;
>
> **the surface acoustic wave element is a resonator type surface acoustic wave element**; and
>
> **the electrodes include at least one interdigital electrode and reflectors arranged on both sides of the at least one interdigital transducer in a direction of propagation of a surface acoustic wave**. (emphasis added)

With the combination and arrangement of features recited in Applicant's Claim 10, Applicant has been able to provide a surface acoustic wave sensor which includes a surface acoustic wave element with an improved structure and which therefore has high sensitivity. The surface acoustic wave sensor further includes a reaction membrane placed on the surface acoustic wave element and detects a target substance from the change in the mass applied to the surface acoustic wave element (see, for example, paragraph [0009] of Applicant's originally filed Substitute Specification).

The Examiner alleged that Lipskier teaches all of the features recited in Applicant's Claim 10, except for "the surface acoustic wave transducer being a rotation Y-cut $LiTaO_3$ substrate having Euler angles of (0°, 120° to 140°, 0° ± 5°) and the electrodes having a normalized thickness of about 3.0% to 5.0%, the normalized thickness being determined by normalizing the thickness of the electrodes by the wavelength of the surface acoustic wave." The Examiner alleged that Kadota et al. teaches these features.

Thus, the Examiner concluded that it would have been obvious "to substitute a $LiTaO_3$ surface acoustic wave device in the chemical sensor of Lipskier, as taught by Kadota, since doing so causes the propagation loss to become substantially zeros even where the film thickness is extremely small, thereby making the conditioning range of the frequency trimming much wider than conventional surface acoustic wave devices (Kadota: C3/L30-37)." Applicant respectfully disagrees.

At best, Kadota teaches that the specific values for the Euler angles of the $LiTaO_3$ substrate and the normalized thickness of the electrodes disclosed therein are effective to reduce the propagation loss of **a surface acoustic wave filter that utilizes an SH wave**. Kadota neither teaches nor suggests that the specific values for the Euler angles of the $LiTaO_3$ substrate and the normalized thickness of the electrodes disclosed therein could or should be used in a surface acoustic wave filter that utilizes any other type of acoustic wave other than an SH wave, or that the specific values for the Euler angles of the $LiTaO_3$ substrate and the normalized thickness of the electrodes disclosed therein would produce any benefits or advantages in a surface acoustic wave device that utilizes another type of surface acoustic wave.

The chemical sensor shown in Fig. 4a of Lipskier is specifically disclosed as utilizing **a Love wave**, **NOT** an SH wave. Lipskier fails to teach or suggest that the chemical sensor shown in Fig. 4a of Lipskier could or should utilize any other acoustic waves other than a Love wave, and certainly fails to teach or suggest that the chemical sensor shown in Fig. 4a of Lipskier could or should utilize an SH wave.

Since Kadota fails to teach or suggest that the specific values for the Euler angles of the $LiTaO_3$ substrate and the normalized thickness of the electrodes disclosed therein could or should be used in a surface acoustic wave filter that utilizes a Love wave or that the specific values for the Euler angles of the $LiTaO_3$ substrate and the normalized thickness of the electrodes disclosed therein would produce any benefits or advantages in a surface acoustic wave device that utilizes a Love wave, one of ordinary skill in the art would clearly have had no reason or motivation whatsoever to substitute a $LiTaO_3$ surface acoustic wave device of Kadota in the chemical sensor of Lipskier.

The Examiner is reminded that obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion, or incentive supporting the combination. In re Geiger, 815 F.2d 686, 2 USPQ 1276, 1278 (Fed. Cir. 1987).

In addition, contrary to the Examiner's allegations, Lipskier neither teaches nor suggests that the electrodes SE_1 and SE_2 of the chemical sensor shown in Fig. 4a of Lipskier are made of Au. In contrast, the only element of the chemical sensor shown in Fig. 4a of Lipskier that is disclosed as being made of gold is the intermediate layer L1. Thus, Lipskier clearly fails to teach or suggest the feature of "electrodes, principally containing Au, and arranged on the $LiTaO_3$ substrate to excite a surface acoustic wave" as recited in Applicant's Claim 10.

Furthermore, if the intermediate layer L1 of Lipskier is made of Au, then the electrodes SE_1 and SE_2 would not and could not also be made of Au, because the intermediate layer L1 and the electrodes SE_1 and SE_2 are arranged to be in contact with one another. If the intermediate layer L1 and the electrodes SE_1 and SE_2 were made of the same material and in contact with one another, then the chemical sensor of Lipskier would be incapable of exciting a surface acoustic wave therein.

The Examiner is reminded that if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984) and MPEP § 2143.01.

In order to more clearly distinguish Applicant's Claim 10 over Lipskier and Kadota, Applicant's Claim 10 has been amended to recite the features of "the surface acoustic wave element is a resonator type surface acoustic wave element" and "the electrodes include at least one interdigital electrode and reflectors arranged on both sides of the at least one interdigital transducer in a direction of propagation of a surface acoustic wave." Support for these features is found, for example, in paragraph [0073] of Applicant's originally filed Substitute Specification.

Lipskier fails to teach or suggest any reflectors whatsoever or that the chemical sensor shown in Fig. 4a of Lipskier could or should include any reflectors. Thus, Lipskier certainly fails to teach or suggest the features of "the surface acoustic wave element is a resonator type surface acoustic wave element" and "the electrodes include at least one interdigital electrode and reflectors arranged on both sides of the at least one interdigital transducer in a direction of propagation of a surface acoustic wave" as recited in Applicant's Claim 10.

Since Lipskier fails to teach or suggest any reflectors whatsoever, Lipskier clearly fails to teach or suggest the any reactance membrane that covers any reflectors. Thus, Lipskier certainly fails to teach or suggest the features of "a reaction membrane, bound to a target substance or a binding substance bound to the target substance, covering the electrodes arranged on the $LiTaO_3$ substrate," wherein "the electrodes include at least one interdigital electrode and reflectors arranged on both sides of the at least one interdigital transducer in a direction of propagation of a surface acoustic wave" as recited in Applicant's Claim 10.

Accordingly, Applicant respectfully requests reconsideration and withdrawal of the rejection of Claim 1 under 35 U.S.C. § 103(a) as being unpatentable over Lipskier in view of Kadota.

In view of the foregoing amendments and remarks, Applicant respectfully submits that Claim 10 is allowable. Claims 11-18 depend upon Claim 10, and are therefore allowable for at least the reasons that Claim 10 is allowable.

In view of the foregoing amendments and remarks, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are solicited.

The Commissioner is authorized to charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-1353.

Respectfully submitted,

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